

1 (1)

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3 1. A printing system comprising:

4 rewritable media having a bistable, electrochromic, colorant layer susceptible to
5 localized electrical fields; and

6 associated with said media, an electrode subsystem producing said localized
7 electrical fields.

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9 2. The system as set forth in claim 1 further comprising:

10 a transport for moving a sheet of said media passed said electrode subsystem.

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12 3. The system as set forth in claim 2, the transport further comprising:

13 at least one media position sensor.

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15 4. The system as set forth in claim 1 further comprising:

16 means for downloading, storing, sequencing, and printing text and images.

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18 5. The system as set forth in claim 1 configured as a portable hard copy printing
19 apparatus.

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21 6. The system as set forth in claim 1 in a portable computer appliance.

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23 7. The system as set forth in claim 1 in a telecommunications device.

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8. The system as set forth in claim 1 wherein said electrode subsystem substantially stationary and configured to print on a sheet of said media as said media is translated passed said electrode subsystem.

9. The system as set forth in claim 1 wherein said electrochromic colorant layer further comprises:
at least one layer of a molecular colorant coating wherein molecules of the coating are at least bichromal and subjectable to bistable switching between color states under influence of said localized electric field.

10. The system as set forth in claim 9 comprising:
said molecules exhibit an electric field induced band gap change, occurring via a mechanism selected from a group including (1) molecular conformation change or an isomerization, (2) change of extended conjugation via chemical bonding change, and (3) molecular folding or stretching.

11. The system as set forth in claim 2, said transport further comprising:
electrical generators connected to said electrode subsystem for producing said localized electrical fields.

12. The system as set forth in claim 9, the molecular colorant coating further comprising:
a mosaic pixel pattern of primary color pixels such that full color printing is produced by said electrode subsystem on said media.

14. The system as set forth in claim 1, said electrode subsystem further comprising:

i means to field address temporally and spatially.

2
3 15. A hard copy printing method comprising:

4 selectively providing localized electric fields, each of said fields conforming to a
5 predetermined picture element size;

6 transporting a printing medium across said fields such that a bistable
7 electrochromic colorant layer of said medium is subjected to said electric fields; and
8 manipulating said electric fields to produce printed data onto said electrochromic
9 colorant layer.

n. 9. 10
11 16. The method as set forth in claim 15 wherein a first polarity of said localized
12 electric fields prints a picture element.

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14 17. The method as set forth in claim 16 wherein a reverse polarity of said first polarity
15 of said localized electric fields erases a picture element.

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17 18. The method as set forth in claim 15 used in a portable hard copy apparatus.

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19 19. The method as set forth in claim 15 used in a portable computer appliance.

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21 20. The method as set forth in claim 15 used in a telecommunications device.

22
23 21. The method as set forth in claim 15 wherein said electrochromic colorant layer is
24 at least one layer of a molecular colorant coating wherein molecules of the coating are at
25 least bichromal and subjectable to bistable switching between color states under
26 influence of said localized electric field.

1 22. The method as set forth in claim 21 wherein said molecules exhibit an electric
2 field induced band gap change, occurring via a mechanism selected from a group
3 including (1) molecular conformation change or an isomerization, (2) change of extended
4 conjugation via chemical bonding change, and (3) molecular folding or stretching.

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6 23. A method of doing business, the method comprising:

7 providing a printing apparatus including an electrode subsystem for providing
8 selectively localized electric fields corresponding to picture elements printable from
9 digital data;

10 providing a rewritable media instrument susceptible to said fields wherein said
11 media instrument is associated with a service and use fees associated therewith; and
12 printing and reprinting legible information on said media instrument associated
13 with said use fee and a current balance with said stationary printing apparatus whenever
14 said media instrument is used in association with said printing apparatus.

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16 24. The method as set forth in claim 23 wherein a first polarity of said localized
17 electric fields prints a picture element.

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19 25. The method as set forth in claim 24 wherein a reverse polarity of said first polarity
20 of said localized electric fields erases a picture element.

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22 26. The method as set forth in claim 23 wherein said business is conducted using a
23 portable hard copy apparatus.

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25 27. The method as set forth in claim 23 wherein said business is conducted using a
26 portable computer appliance.

1 28. The method as set forth in claim 23 wherein said business is conducted using in
2 a telecommunications device.

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4 29. The method as set forth in claim 23 wherein said electrochromic colorant layer is
5 at least one layer of a molecular colorant coating wherein molecules of the coating are at
6 least bichromal and subjectable to bistable switching between color states under
7 influence of said localized electric field.

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9 30. The method as set forth in claim 29 wherein said molecules exhibit an electric
10 field induced band gap change, occurring via a mechanism selected from a group
11 including (1) molecular conformation change or an isomerization, (2) change of extended
12 conjugation via chemical bonding change, and (3) molecular folding or stretching.

13
14 31. (New) A method of doing business of printing hard copy, the method comprising:
15 receiving digital data representative of a document; and
16 producing an image of said document on a rewritable media having at least one
17 layer of a molecular colorant wherein molecules thereof are at least bichromal and
18 subjectable to bistable switching between color states under influence of localized
19 electric fields.

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21 32. (New) The method as set forth in claim 31 wherein said molecules exhibit an
22 electric field induced band gap change, occurring via a mechanism selected from a
23 group including (1) molecular conformation change or an isomerization, (2) change of
24 extended conjugation via chemical bonding change, and (3) molecular folding or
25 stretching.

26
27 33. (New) A method of manufacturing a hard copy system having a print zone, the
28 method comprising:

1 mounting adjacently to said print zone a subsystem having a plurality of
2 electrodes; and
3 adjusting said electrodes for providing selectively localized electric fields
4 corresponding to picture elements printable from digital data such that adjacently
5 positioned rewritable media having a molecular colorant has molecules of said colorant
6 selectively switched between at least two color states by said fields.

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8 34. (New) The method as set forth in claim 33 further wherein said plurality of
9 electrodes is a linear array for sequentially printing lines of picture elements across said
10 media.

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12 35. (New) The method as set forth in claim 33 wherein said plurality of electrodes is
13 a matrix array for simultaneously printing a matrix of picture elements on said media.